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2664 #

IN THE UNITED STATES PATENT AND  
TRADEMARK OFFICE

Art Unit 2664  
Examiner Yvonne Quy M. Ha

In Re: Yuri Shtivelman et al.  
Case: P3353D1  
Serial No.: 09/730,416  
Filed: 12/04/2000  
Subject: Method for Estimating Telephony System-Queue Waiting Time in  
an Agent Level Routing Environment

To the Commissioner of Patent and Trademarks  
Washington, D.C. 20231

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Technology Center 2600

Dear Sir:

**Amendment A**

The claims are reproduced below with appropriate status indication:

1. (Currently amended) A method for estimating, ~~by a processor coupled to a call~~  
~~waiting queue~~, waiting time for a designated call in the a call-waiting queue;  
~~wherein a plurality of agents handle calls in multiple queues~~, comprising steps of:
- ~~(a) determining the number of calls ahead of the designated call;~~
  - ~~—— (b) determining the historical average call handling time  $T(h)$  for calls in~~  
~~the queue;~~
  - ~~—— (c) for each agent handling calls in the queue determining the portion of~~  
~~the agent's time devoted to the queue;~~
  - ~~—— (d) determining an effective number of agents devoted to the queue by~~  
~~summing the time portions over all of the agents; and~~

~~(e a) multiplying the number of calls ahead of the call by an average call handling time; and from step (a) by the historical call handling time from step (b); and dividing the result by the effective number of agents determined in step (d).~~

(b) dividing the result from step (a) by an effective number of agents assigned to the queue.

2. (Currently amended) The method of claim 1 ~~further adapted to account for abandoned calls by additional steps of (f) comprising a step for determining an abandoned call rate; (g) determining a not-abandoned call rate by subtracting the abandoned call rate from integer 1; and (h) and multiplying the result of step (e) claim 1 by the result of step (g) not-abandoned call rate.~~

3. (Currently amended) A call routing system comprising:

a call switching apparatus for switching calls to a plurality of agent stations; and

~~a computer telephony integration (CTI) processor coupled to the switching apparatus and adapted to maintain multiple routing queues by a plurality of enterprise rules, wherein agents are assigned to multiple queues~~ a facility enabling the switching apparatus to maintain routing queues; and

~~an estimating application executing on the CTI processor and adapted for determining an estimated waiting time for a selected call in a selected queue; wherein the estimating application multiplies the number of calls ahead of the selected call in the selected queue by an historical average call handling time for calls in the queue, and divides the result by an effective number of agents devoted to the queue determined by summing, over all agents serving the queue either full or part time, the portions of each agents time devoted to the selected queue~~ wherein the system determines a wait time by multiplying the number of calls ahead of a specific call by an average call handling time and divides the result by an effective number of agents assigned to the queue.

4. (Currently amended) The call routing system of claim 3 wherein the ~~estimating application system~~ further accounts for abandoned calls by determining a non-abandoned call rate ~~from an abandoned call rate~~ and multiplying the ~~estimated call waiting~~ wait time determined in claim 3 by the result.

5. (Currently amended) The call routing system of claim 3 wherein one or more of the ~~call waiting~~ queues are virtual queues.

6. (Currently amended) The call routing system of claim 3 wherein one or more of the ~~multiple routing~~ queues are priority queues wherein newly arrived calls may be inserted in the queue by priority ahead of calls already in the queue.

7. (Currently amended) A computer ~~telephony integration (CTI)~~ software application for determining an estimated call-waiting time, comprising:

a ~~counting~~ function for determining the number of calls ahead of a designated call, and multiplying that number by an estimated call-handling time, achieving a gross waiting time; and

a ~~function for determining the historical average call handling time  $T(h)$  for calls waiting in the queue;~~

a ~~calculation function for retrieving the portion of time each agent assigned to the queue spends in tending to calls in the queue;~~

~~— a summation function for determining an effective number of agents devoted to the queue by summing the time portions over all of the agents; and~~

a ~~calculation function for determining the estimated waiting time by multiplying the number of calls ahead from the counting function by the historical call handling time, and dividing the gross waiting time result by the an effective number of agents assigned to the queue from the summation function.~~

8. (Currently amended) The ~~CTI~~ application of claim 7 ~~further~~ comprising a function for accounting for abandoned calls by determining a non-abandoned call rate ~~from an abandoned call rate~~ and multiplying that by the estimated call waiting time ~~previously determined by the result~~.